

Date Planned : __ / __ / __	Daily Tutorial Sheet - 11	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level – 2 	Exact Duration : _____

Paragraph for Q.126 to 128

Consider the equation $|x^2 - 2x - 3| = m, m \in R$.

126. If the given equation has four solutions, then :

- (A) $m \in (0, \infty)$ (B) $m \in (-1, 3)$ (C) $m \in (0, 4)$ (D) None of these

127. If the given equation has three solutions, then :

- (A) $m \in (0, \infty)$ (B) $m \in \{4\}$ (C) $m \in (0, 4)$ (D) $m \in (-1, 3)$

128. If the given equation has two solutions, then :

- (A) $m \in [4, \infty)$ (B) $m \in (-1, 3)$ (C) $m \in (4, \infty) \cup \{0\}$ (D) None of these

Paragraph for Q. 129 to 130

Let $f(x) = ax^2 + bx + c, a \neq 0$, such that $f(-1-x) = f(-1+x) \forall x \in R$. Also given the $f(x) = 0$ has no real roots and $4a + b > 0$.

129. Let $\alpha = 4a - 2b + c, \beta = 9a + 3b + c, \gamma = 9a - 3b + c$, then which of the following is correct?

- (A) $\beta < \alpha < \gamma$ (B) $\gamma < \alpha < \beta$ (C) $\alpha < \gamma < \beta$ (D) $\alpha < \beta < \gamma$

130. Let $p = b - 4a, q = 2a + b$, then pq is:

- (A) Negative (B) Positive (C) 0 (D) Nothing can

Paragraph for Q. 131 to 132

If α, β are the roots of equation, $(k+1)x^2 - (20k+14)x + 91k + 40 = 0; (\alpha < \beta) k > 0$, then answer the following questions.

131. The smaller root (α) lie in the interval:

- (A) (4, 7) (B) (7, 10) (C) (10, 13) (D) None of these

132. The larger root (β) lie in the interval:

- (A) (4, 7) (B) (7, 10) (C) (10, 13) (D) None of these

Paragraph for Q. 133 to 135

Let $f(x) = x^2 + bx + c \forall x \in R, (b, c \in R)$ attains its least value at $x = -1$ and the graph of $f(x)$ cuts y -axis at $y = 2$.

133. The least value of $f(x) \forall x \in R$ is:

- (A) -1 (B) 0 (C) 1 (D) $\frac{3}{2}$

134. The value of $f(-2) + f(0) + f(1)$ is equal to:

- (A) 3 (B) 5 (C) 7 (D) 9

135. If $f(x) = a$ has two distinct real roots, then complete set of values of a is:

- (A) $(1, \infty)$ (B) $(-2, -1)$ (C) $(0, 1)$ (D) $(1, 2)$

Paragraph for Q. 136 to 137

Consider the equation $(\log_2 x)^2 - 4\log_2 x - m^2 - 2m - 13 = 0, m \in R$. Let the real roots of the equation be x_1, x_2 such that $x_1 < x_2$.

136. The set of all values of m for which the equation has real roots is:

- (A) $(-\infty, 0)$ (B) $(0, \infty)$ (C) $[1, \infty)$ (D) $(-\infty, \infty)$

137. The sum of maximum value of x_1 and minimum value of x_2 is:

- (A) $\frac{513}{8}$ (B) $\frac{513}{4}$ (C) $\frac{1025}{8}$ (D) $\frac{257}{4}$

Paragraph for Q. 138 to 139

The equation $x^4 - 2x^3 - 3x^2 + 4x - 1 = 0$ has four distinct real roots x_1, x_2, x_3, x_4 such that $x_1 < x_2 < x_3 < x_4$ and product of two roots is unity, then:

138. $x_1x_2 + x_1x_3 + x_2x_4 + x_3x_4$ is equal to:

- (A) 0 (B) 1 (C) $\sqrt{5}$ (D) -1

139. $x_2^3 + x_4^3$ is equal to:

- (A) $\frac{2+5\sqrt{5}}{8}$ (B) -4 (C) $\frac{27\sqrt{5}+5}{4}$ (D) 18